

### **Listing of Claims:**

This listing of claims reflects all claim amendments and replaces all prior versions, and listings, of claims in the application. In brief, claims 1-25 have been canceled, without prejudice, and new claims 26-43 have been added.

1-25. (Canceled)

26. (New) A system for performing a multiplexed experiment, comprising:

a set of particles each having light polarizing properties in accordance with an optically detectable code pattern, the code patterns of at least two of the particles being distinct; and

two or more distinct samples and/or reagents connected to the particles in correspondence with the distinct code patterns, so that the set of particles can be analyzed in the same multiplexed experiment by identifying samples and/or reagents according to the code patterns of the respective particles to which the samples and/or reagents are connected.

27. (New) The system of claim 26, wherein each particle includes a substrate and at least one layer of a material with light polarizing capability disposed on the substrate, and wherein a part of the substrate is cleared of the at least one layer of material in accordance with a code pattern.

28. (New) The system of claim 27, wherein each code pattern is configured to be recognized in a wavelength range of light, and wherein the substrate has low absorption in the wavelength range.

29. (New) The system of claim 28, wherein the at least one layer of material has linear light polarization capability in the wavelength range of light and low absorption of light in other wavelength ranges.

30. (New) The system of claim 27, wherein each particle includes at least one cladding layer over the at least one layer of material.

31. (New) The system of claim 30, wherein the substrate has a thickness of about 0.01 to 1 mm, wherein the at least one layer of material has a thickness of about 0.1-100 microns, and wherein the at least one cladding layer has a thickness of about 1-300 microns.

32. (New) The system of claim 27, wherein the at least one layer of material includes a first layer and a second layer of material each having light polarizing capability.

33. (New) The system of claim 32, wherein each of the first and second layers of material defines a respective polarizing plane, and wherein the respective polarizing planes are substantially perpendicular to one another.

34. (New) The system of claim 32, wherein a portion of the substrate is cleared of the second layer of material.

35. (New) The system of claim 34, wherein each of the first and second layers of material defines a respective pattern, and wherein the respective patterns substantially coincide.

36. (New) The system of claim 32, wherein each particle includes respective first and second cladding layers disposed over the respective first and second layers of material.

37. (New) The system of claim 26, wherein the particles are connected to distinct populations of biological cells such that distinct code patterns correspond with distinct cell populations.

38. (New) A method of performing a multiplexed experiment, comprising:  
providing a set of particles each having light polarizing properties in accordance with an optically detectable code pattern, the code patterns of at least two of the particles being distinct, the set of particles also having two or more distinct samples and/or reagents connected to the particles in correspondence with the distinct code patterns; and

detecting the distinct code patterns of the at least two particles, at least partially according to their respective light polarizing properties, to identify the distinct samples and/or reagents to which the at least two particles are connected.

39. (New) The method of claim 38, wherein the step of detecting is performed with the particles arbitrarily distributed on a surface.

40. (New) The method of claim 39, wherein step of detecting includes a step of acquiring at least two images of the surface with the particles.

41. (New) The method of claim 40, wherein the step of acquiring includes acquiring a first image and a second image and is performed using polarized light having a polarization plane, and wherein the polarization plane for the first image is substantially non-parallel to the polarization plane for the second image.

42. (New) The method of claim 41, wherein the polarization planes for the first and second images are substantially perpendicular to one another.

43. (New) The method of claim 40, wherein the step of acquiring includes (1) a step of numerically combining the at least two images, and (2) a step of performing image recognition of the distinct code patterns.